GrummanWorld

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Grumman Emerges From First Round Gramm-Rudman Cuts With Minor Scrapes

It's officially called the Balanced Budget and Emergency Deficit Control Act of 1985. But the new law is better known as the Gramm-Rudman bill, named after its two chief Senate authors. Right now, this deficit-reducing bill packs a lot of questions.

Basically, the law requires a balanced federal budget by the year 1991. To meet its goal of eliminating the $200.5 billion deficit by 1991, the Gramm-Rudman law sets annual deficit ceilings. It requires automatic budget cuts in hundreds of government programs each year that the President and Congress fail to meet those targets.

"We cannot be sure exactly what the impact will be on Grumman," says Grumman President George Skurla. "We are going to get bruised to some degree – but we hope not battered – in the final outcome."

March 1 is the earliest Gramm-Rudman can take effect in fiscal year 1986, which runs from October 1, 1985, through September 30, 1986.

For fiscal year '86 under Gramm-Rudman, the deficit would be kept at $171.9 billion. But because the deficit is already estimated at $220.5 billion, the budget must be reduced $11.7 billion between March 1 and September 30. Additional cuts to cover the remaining $36.9 billion will be made in fiscal year 1987.

"The initial across-the-board reduction to all but exempt defense programs was about five percent, while the impact to Grumman programs averaged four percent," says Skurla. Some defense programs were exempted to protect the savings of fixed-price or multi-year programs that would otherwise be lost.

"The impact to Grumman was only four percent because the multi-year C-2A Greyhound and the fixed-price development contracts for the F-14D and A-6F were exempt," says Skurla. "Most of Grumman's other contracts are also fixed-price, and so they will not be affected in fiscal year '86 by Gramm-Rudman.

"In fact, fiscal year '86 appropriations for Grumman programs totalled $3.5 billion," adds Skurla. "Of that amount, Gramm-Rudman would cut $145 million." Skurla believes most of this relatively small reduction will be made in the areas of spares and support. "We expect that aircraft quantities will remain untouched," he adds.

Fiscal year '87, which begins October 1, 1986, will be another story. Gramm-Rudman sets a deficit ceiling of $144 billion for fiscal year '87. These deficit reductions must also absorb the five months (October 1, 1985 to February 28, 1986) that were not accounted for in the fiscal year '86 cuts. That will make the fiscal year '87 cuts the deepest in the five-year Gramm-Rudman plan.

Tomcat Spared Cuts. *Gramm-Rudman forced initial across-the-board reductions of about five percent. Because certain defense programs – including the F-14 (above) development program – were exempt, the impact to Grumman programs averaged four percent. (Photos by Rich Breunig)*

"Although it is likely Grumman programs will experience greater cuts in fiscal year '87, it is too early to determine how severe the impact will be," says Skurla.

A number of events could alter the outlook and the potential effect on Grumman and its subcontractors.

First, the constitutionality of Gramm-Rudman is being challenged in the courts. The Supreme Court could rule on this issue as early as June 1986. The Supreme Court will determine if Congress has the right to delegate power to trim the budget and if the General Accounting Office is the appropriate agency to specify the final cuts.

Regardless of the court ruling, Congress and the Administration could achieve an agreement that meets or exceeds the Gramm-Rudman deficit reduction goals. This would probably require a combination of reductions in both defense and non-defense spending, as well as an increase in taxes. Assuming such an agreement on taxes and spending is achieved, defense cuts would result from negotiating needs and affordability as opposed to automatically cutting everything at some fixed percentage.

Intruders For A Fixed Price. *The Gramm-Rudman deficit-reduction law will not affect Grumman's A-6F development program in fiscal year 1986. The contract was spared cuts because it is a fixed priced development pact, and associated savings to the government would have been forfeited if the contract was voided.*

Failure of Congress and the Administration to agree on the fiscal year 1987 budget would trigger automatic cuts by Gramm-Rudman. From 1987 through 1991, deficit reduction cuts would apply across-the-board percent reductions with rare exceptions and trade-offs as allowed in fiscal year '86.

"While the F-14D and A-6F development programs and the multi-year C-2A procurement will still be exempt," warns Skurla, "all other Grumman programs would be vulnerable."

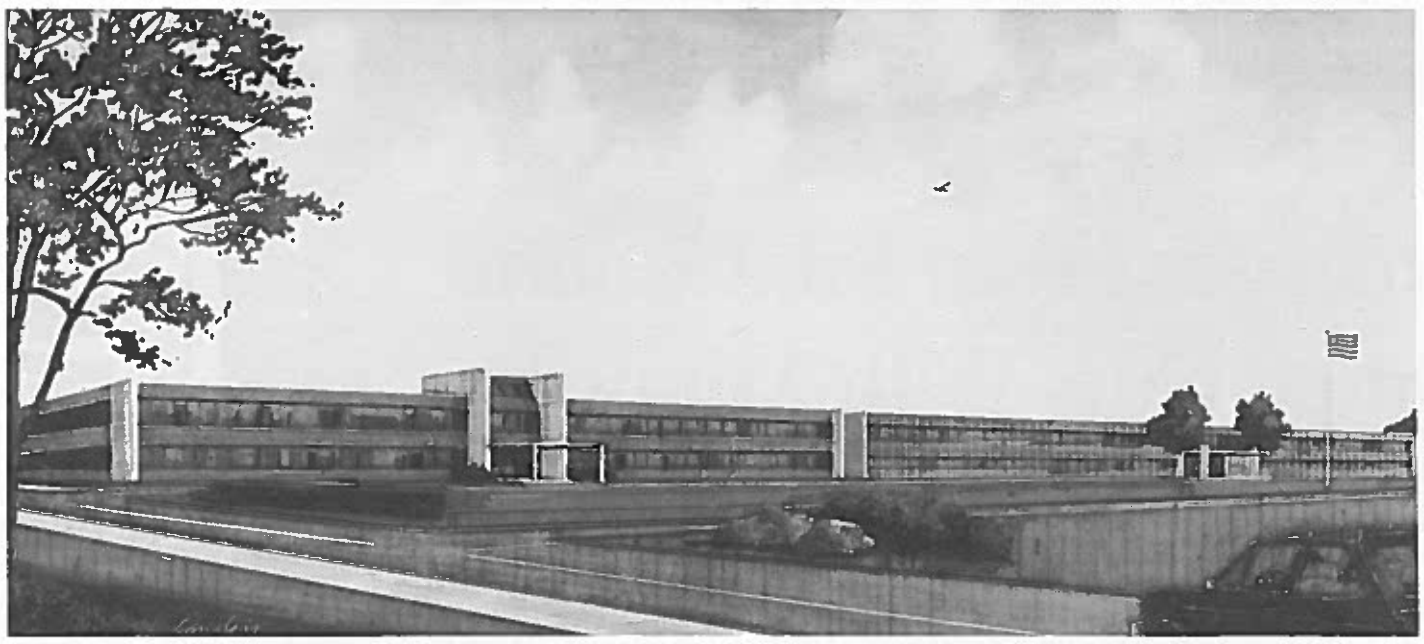
The federal deficit forecast for 1987 will not be measured until August 15, 1986, and that will form the basis for determining precise fiscal year '87 cuts. However, cuts of 10 to 15 percent or more are expected.

In any given fiscal year, as the Administration and Congress formulate budgets to meet the Gramm-Rudman goals, Grumman and other defense firms will face possible modification or cancellation of existing contracts. In rare cases would programs be increased.

"In our opinion, our programs are at the very core of the nation's vital tactical forces and as such would be less vulnerable to cuts," says Skurla.

"We plan to step up our activities to protect our position, particularly in the area of tactical programs," he adds. "Although reductions in sales could occur, we anticipate no major disruptions, and therefore, little adverse effect on our profitability.

"In the meantime," says Skurla, "it is of paramount importance that Grumman keep on delivering quality hardware on time and at costs to the government that are affordable." ■



View From Sunrise Highway. *The new 65,000 square-foot addition at Great River is going up next to the existing office building there and matches the old one's architecture. Between 250 and 300 Grummanites will work in the new addition when it opens in December.*

Great River Breaks Ground For New Offices

As viewed from Sunrise Highway, Great River Operations will soon have a twin.

A new, 65,000 square-foot building is going up next to the existing offices at Electronics Systems Division's main manufacturing facility. Twice as wide as the existing building, the new structure will match the old one's architecture – even down to the green panels on the exterior.

Between 250 and 300 Grummanites will work in the new building when it opens in December of this year. On the first floor will be engineering, hardware and software development labs, and other labs. Program management, marketing, estimating, resources, and systems management will occupy the second floor.

According to Paul Andrisani, manager of Facilities Planning for Great River Operations, the additional building will solve a number of space problems. For instance, 40,000 square feet of temporary offices will be phased out.

"However, our goal is to free up more floor space for manufacturing," says Andrisani. At Great River, the demand for manufacturing space stems from more military and commercial business in the Electronics Systems Division.

The building will be set up to accommodate growth in all the departments it will house, Andrisani adds. The designer and builder on the project is Fortunato and Sons. ■

Vanpools Can Relieve Commuter's Headaches

It's 5 p.m., and the traffic creeps along at 10 m.p.h. You shift into first . . . again. At every entrance, cars crowd into the already-jammed right lane. The drivers in the other three lanes weave madly, blaring their horns.

#$%&*!

You feel like a Manhattan cabdriver.

If you've come to hate fighting traffic, vanpooling or carpooling could be a pleasant alternative. Grummanites on Long Island can take advantage of a program run through Island Rides, a local nonprofit corporation.

When you apply for vanpooling, Island Rides uses its Ridematch computer to match you with 10 to 14 other Grumman commuters. It also helps your group get organized, and provides each group with a new, fully equipped van.

Carpool applicants are matched with other compatible Grumman commuters and provided with a Ridematch list. The Island Rides/Grumman program has eight successful vanpools and has provided over 300 Ridematch lists to interested carpoolers.

In a vanpool, one member drives the van in exchange for free commutation and personal use. The rest evenly divide the operating costs. The van is leased – the group needn't worry about maintenance and insurance.

Ron Sadler, an engineer in Bethpage's Building 31, has been vanpooling for eight years. He first signed up during the energy crisis. "It became something of a crusade for me," he recalls. "Even though the van only gets 10 miles to the gallon, divide that by 15 people. You're making a significant contribution to, number one, getting traffic off the road, and number two, saving fuel."

A third benefit only became apparent to Sadler after he had been vanpooling several months. "You really reduce wear and tear on your vehicle," he says. "I used to put 20,000 miles each year on mine. Now, I've reduced that to around 5,000 or 6,000."

This van starts out each morning in Shoreham and winds its way into Bethpage. Sadler boards at a pickup point in Port Jefferson, about two miles from his home, and gets to work at approximately 7:30 a.m. Afternoon departures are set according to the latest member's quitting time – that's 5:48 p.m. in Sadler's group.

Vanpoolers can qualify for reduced insurance premiums, since their cars aren't used for commuting. And they never have to worry about how they'll get to work – an important consideration for those with perpetual auto woes.

If you own two cars, and can walk to the pickup point, you may even be able to get by with just one car.

The per-person cost of belonging to a vanpool varies according to the number of members and the operating expenses. Sadler's group requested a deluxe van, for which each pays an extra $10 per month. Total costs are $60 to $80 each per month.

As a backup driver, Sadler drives alternate weeks. "When I'm not driving, I can sleep," he says. "Other people read and since the van has individual lights like on an airplane, they don't bother anybody. You can't beat it for comfort."

Stuart Operations in Florida also has a vanpool, serving Grummanites from the Fort Pierce-Port St. Lucie area. It is arranged through the state of Florida's Share-A-Van program. Aboard their 1983 Dodge van, the nine vanpoolers are treated to color TV and occasional movies. Driver Harry Harris hopes to expand the program to serve other areas and people on the early and late shifts.

There are drawbacks to vanpooling. It will invariably take longer to get home via vanpool – there are other people to drop off. It also helps if you have fairly fixed starting and quitting times. If you like to work until 7:30 p.m. several nights a week, vanpooling probably won't suit you – and you won't get a refund for the days your seat is empty.

Interested in vanpools? Go to your nearest Employee Services office and complete a ride-sharing application form. You can apply for both carpooling and vanpooling. There is no cost or obligation for the Ridematch services. Mail the form to Betty Fallon, mail stop C11-GHQ. Or call Island Rides at (516) 423-CARS.

If you work at Stuart, Florida, call Harry Harris there at Ext. (112) 410. ■

Bldg. 117 Opens

Field Operations and Technical Services' new operating unit called Aircraft Services have a new home: Building 117 in Bethpage.

The facility is at the north end of the Bethpage complex on Stewart Avenue near South Oyster Bay Road. Visitors can enter Building 117 from Stewart Avenue or from within the complex. Phone numbers for people in these two groups remain the same.

Going Abroad? Play It Cool

Grumman is doing more and more business with other nations, and that means more Grummanites are traveling internationally.

Corporate Security advises Grummanites on foreign travel – both leisure and business – to eliminate items that identify them as defense industry employees. If at all possible, leave business cards, ID badges, lapel pins, tie tacks, 25-year watches, and the like at home. Things that absolutely have to be brought should be packed in *checked* baggage. Avoid discussing your work or Grumman with anyone other than business associates. Stay safe.

Retirees

On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

Michelina M. Accardi (30), Charles B. Drapeau (40), George Harrison (1), Lawrence E. Lytle (34), Louis Perez (66), Tullio Prisco (112), Ralph Porcello (2), John L. Schwab (2), Robert A. Stewart (106), William A. Lindenfelser (106), Sylvia Owen (45), Francis E. Butler (110), Rafael Castro (43), Nickolaus J. Haus Jr. (Wh.9), Alex J. Bernadski (43) David S. Biggs (1), William B. Nanos (1), Melvin Paiken (5), Carlo R. Paladino (4), Harry W. Schmidt (5), Arthur W. Skillman (4), Ann M. Santucci (30), John H. Grim Sr. (5), Richard E. Lynne (77), Marshall J. Corbett (5), Alfred R. Tobie Jr. (15), Philip A. Lewin (44), John M. McNamara (30), Mary W. Roy (GHQ), Frederick C. Blesse (GHQ), Edward L. Weiss (9), John J. Stiers (3), Ellen J. Raymond (9), Howard S. Liebman (39), Dave W. Lang (5), Michael Meley (2), Thomas A. Costa (25), George H. Geist (3), Nina Kunz (30), Hugh Tonner (6).

Let Us Know

We don't want to do all the talking.

We'd like to know what you think about the things you see in these pages, and what you see going on in the company. Serious comments, questions and complaints are welcomed, and will be answered by the people most qualified to respond. We'll get back to you promptly with their replies. If the topic is of general interest, we'll print it.

Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A22-GHQ, Bethpage, N.Y. 11714, and should include your name and address. Letters may be edited for clarity or space.

Inside The Electronic Classroom

Bench electricians Bruno Cereghino (standing) and Danny O'Brien, are assembling Grumman's Integrated Systems Maintenance Trainer. When completed, the trainer will be used by sailors to learn how to maintain the E-2C's target detection systems.

The trainer is being built at Great River Operations on Long Island, and is slated for delivery to the Miramar Naval Air Station in December of this year. It will be the second in the Navy's inventory; the first is at the Norfolk Naval Air Station in Virginia.

The newer trainer has a fault insertion device that lets the instructor create problems that the students have to find and fix. Under the $23 million contract which includes building the Miramar trainer, Grumman will also put a fault insertion device in the Norfolk trainer. (Photo by Jim Wagner)

Grumman Ends 1985 With Record Backlog

On February 3, Grumman announced its 1985 operating results. The company reported a net income of $81.5 million, or $2.65 per share, for 1985. This was a decrease of 25 percent from the $108.4 million, or $3.62 per share, reported in 1984.

In its 1985 operating results, the company reported that last year's sales of $3.1 billion increased 19 percent over 1984. The decline in net income resulted from reduced profits in the aerospace segment and a substantial increase in interest cost. However, the company finished the year with a record funded backlog of $5.4 billion.

Chairman Jack Bierwirth called 1985 a year of continuing development. "We have progressed well in strengthening our talents and improving our facilities, and our efforts have paid off in our ability to compete for the biggest programs in our industry," said Bierwirth.

"We won Joint STARS and the Intermediate Forward Test Equipment award in 1985. We are also in strong contention for awards on NASA's Space Station, a large test equipment program for the U.S. Navy and several Strategic Defense Initiative programs," continued Bierwirth. "Our success has been due to our growing skills in the world of electronics.

For the fourth quarter of 1985, net income was $23.1 million, or $.76 per share, on sales of $831.9 million. For the same period in 1984, sales were $744.7 million and net income was $28.1 million, or $.94 per share. Net income declined because of lower profit margins on aerospace sales, a $3 million loss on the sale of Pearson Yachts and costs from discontinuing solar energy operations.

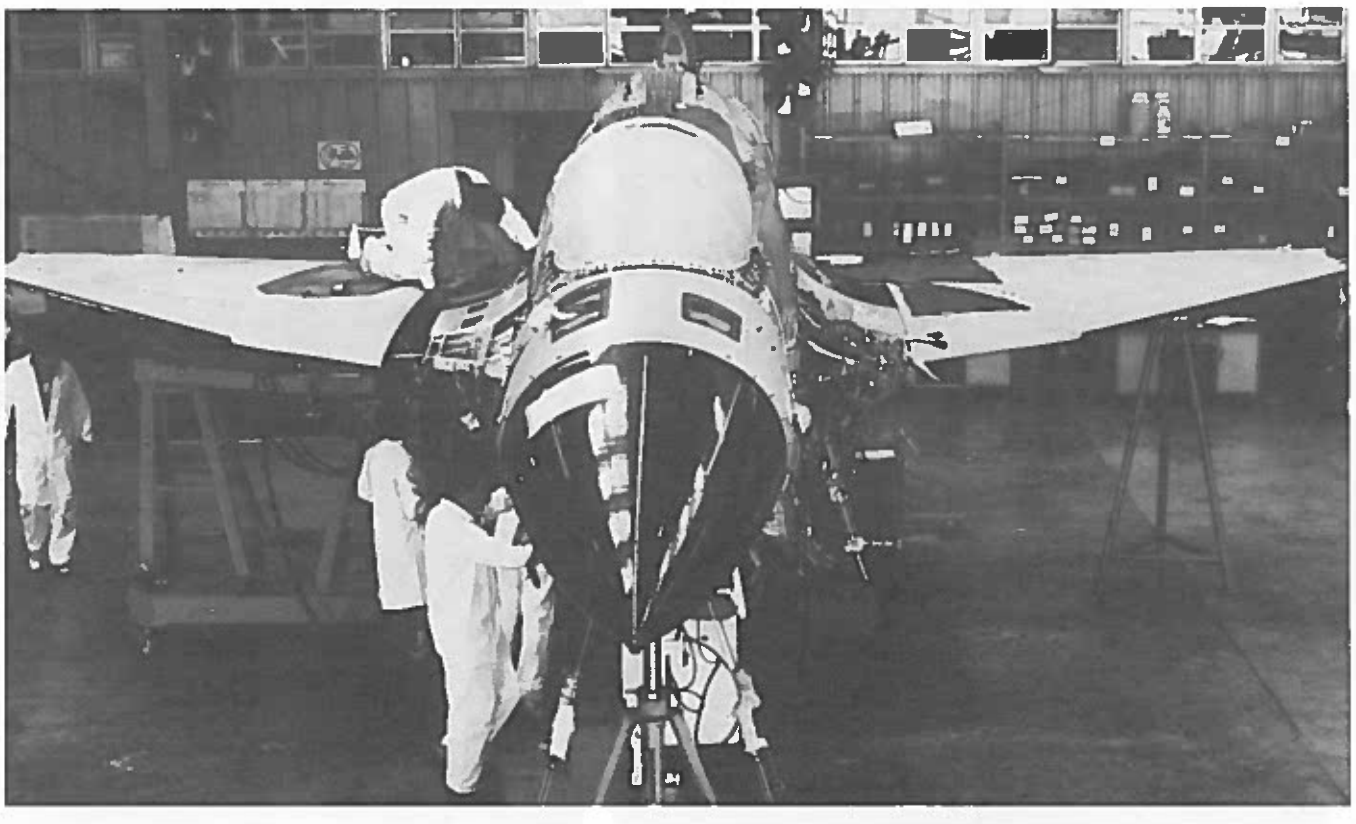
1985 aerospace sales were up $470 million, 20 percent over 1984. Of that increase, $244 million was for the F-14D and A-6F upgrade programs which are being performed at no profit. The rest of the increase came from deliveries of the first C-2A aircraft.

Operating profits did not match increased sales because of a $30 million charge in the third quarter to redesign and repair the F-14 main landing gear bulkhead. In addition, the overall profit rate on most other programs was lower than in 1984, reflecting lower contract prices and higher than expected manufacturing costs, particularly on the C-2A program.

Data Systems' sales and profits rose 24 percent and 41 percent, respectively, with more than half of the increases from inter-divisional activities.

Profits from aluminum truck body sales were up because of lower aluminum prices. However, these commercial gains were offset by lower Gulfstream III sales commissions and the solar energy and Pearson Yacht charges.

Interest costs, at $29.4 million, were up $13.7 million over 1984. ■



New Fighter Gets Its Wings. *At an Israel Aircraft Industries' facility in Israel, Grumman-built wings were recently attached to the new Lavi fighter. Grumman is manufacturing the graphite composite wings and vertical tails under a $170-million development contract. The first Lavi fighter is slated for its maiden flight later this year.*

Court Rules In Favor Of Pension Plan Trustees

Last month, Jacob Mishler, district judge of the Eastern District of New York, ruled that the trustees of the Employee Pension Plan had made a profitable investment when the plan purchased Grumman stock during the time of the attempted takeover of the company by the LTV Corporation.

In ruling for the trustees, he determined that the plan had made a $4.5-million greater profit in comparison to other investments it could have made at the time.

Judge Mishler had been directed to make this determination by the Court of Appeals for the Second Circuit. The Department of Labor had appealed a February 1984 ruling by Judge Mishler to the Circuit Court. It claimed that the trustees of the plan had violated federal pension law in purchasing the 1.68 million shares of Grumman common stock during the period when LTV's tender offer was in effect.

Bldg. 3 Gets Safe

The Bethpage Federal Credit Union's newest Safe machine is in Building 3's former lobby.

There are now 16 Safe Machines. The others are in Bethpage Buildings 1, 2, 5 (one inside and another outside across the street from the main lobby), 25, 30, 35, Calverton's Building 6, Melville's 106, 237 in Woodbury, two in Grumman Headquarters, two in the Credit Union's Bethpage lobby and one outside at its drive-up.

For comprehensive Credit Union services, BFCU has offices in Bethpage, Calverton, Great River, and Melville, Long Island; and Stuart, Florida.

Is It An Eagle

Aerotest helps find out if plane desig

Squeezing both arms into a tight compartment, John McAfee strains to make a few final adjustments to a tiny model of an experimental aircraft.

After six months of work – ironing out design details, manufacturing parts and programming test computers, McAfee and a team of technicians are finally ready. The wind tunnel test will measure what happens to an aircraft flying at more than 1.25 times the speed of sound.

McAfee adjusts a pair of headphones and moves a tiny wire microphone to his lips. A warning horn blows. With a word and the flip of a switch, the test begins. Fifteen seconds later, it's all over.

"It may seem like an awful lot of work for just a few seconds. But you wouldn't believe how much data can be generated in just the blink of an eye,"

'Putting a model in the wind tunnel is sometimes the only way you can verify design information.'

says McAfee. He works in Aircraft Systems' Aerotest department on Long Island.

Wind tunnel tests generate reams of data on aerodynamics, propulsion and thermodynamics for everything from new airframe designs to aircraft components and payload configurations. Design engineers from virtually every Grumman aircraft program turn to Aerotest at some point to find out if their ideas really work.

People in Aerotest get involved long before the wind blows in the high-tech tunnels. "In essence, we are a small but complete engineering department," says Fritz Blomback, Aerotest section head. "We help determine what the design engineers need from the tests, and then help them get it. We do everything from developing software to designing the models to supplying the test data."

Designers need a tremendous amount of information. They need data that will tell them if an airframe will perform as predicted long before it ever gets into production.

The next generation of aircraft will undoubtedly be "unstable" – unable to fly unless aided by computers constantly adjusting the plane's control surfaces. These unstable aircraft have created the need for design data far beyond what's required for

Tiny Tomcat. *Wind tunnel technician Hank Frost adjusts a scale model of the F-14 in Aerotest's 26-inch transsonic tunnel in Farmingdale. (Photos by Bob Settles)*

Before The Wind Blows. *At right, Warren Schaller puts the finishing touches on a Grumman/NASA Research Fighter Configuration model in the Building 5 model shop. Above, technician Barry Charletta makes minor adjustments to the finished RFC model before a test run in the low-speed wind tunnel, located behind Building 25 in Bethpage.*

)r A Turkey?

will fly

conventional aircraft.

In addition, new controls and devices such as canards, vectored thrust engine nozzles and conformal wings have added to the complexity of designing aircraft.

Of course, design engineers can obtain a considerable amount of information from sophisticated computer system tools. "However, there is only so much information an engineer can get from two- or even three-dimensional computer graphics," says Blomback. "Then they come to us and we put it in the wind tunnel."

Because of the time constraints and the sheer volume of information needed, Blomback says the 31-member Aerotest department is always backlogged with work. "Long before we finish one set of tests, we've got requests for a half-a-dozen others piling up behind us."

Putting an aircraft design in a wind tunnel can be an expensive proposition. Aircraft models alone can cost up to $1 million-plus depending the materials used, how complex the model is, and the purpose of the test.

"This might seem like a lot of money for a model airplane," says Blomback. "But putting a model in the wind tunnel is sometimes the only way you can verify design information. There are actually several hundred – even thousands of test runs on a model due to configuration changes and test variables."

Blomback says typical computer printouts of wind tunnel test can stack up well over six feet tall. "The program people are always concerned about costs and tight budgets and that's to be expected. But, when it comes down to getting the information they need for a billion dollar aircraft program, the wind tunnel tests are invaluable," he says. "Furthermore, the model can be modified and retested many times as the design develops."

Gene Toscano, group head for Aerotest model design, points to a current NASA contract to design and build a cryogenic model of the X-29. Cryogenics is the study of what happens in extreme cold – well below sub-zero temperatures. NASA plans to test the cryogenic X-29 model in its new National Transonic Wind Tunnel Facility that uses pure nitrogen gas at minus 300 degrees Fahrenheit.

Carved out of a block of high-tech steel, the model, with a price tag of $1 million, looks like a piece of modern sculpture.

"From day one, it's been a real challenge," says Toscano. "But, when we're finished, it will be unlike anything else in the business – just like the real X-29."

The complex job of building and testing models such as the cryogenic X-29 begins on a small scale, literally. Only one of Grumman's four wind tunnels is large enough for anything bigger than a toy size model. Models range from 1/6th to 1/48th of the actual size of an aircraft.

"We create the model drawings from full scale designs," says Ken Longo, Aerotest design engineer. "We're in the business of designing miniatures – in painstaking detail."

The models themselves are built by craftsmen in the Product Development Operation Center's model shop in Bethpage. Airplane models of all shapes and sizes hang from the shop's steel girder ceiling.

"These days people think of airplanes as high-tech computers with wings," says Fred Berlenbach, model shop assistant foreman. "But here, technology has to take a back seat to craftsmanship."

Models used in slower, subsonic wind tunnel tests are made of wood and aluminum and often include a number of moving parts, removable payload pieces and propulsion simulators. High-speed tests – up to Mach 14 – call for more durable materials. Metal models are machined from solid blocks of steel.

After a model is constructed, it heads for one of Aerotest's four sophisticated wind tunnels. In Bethpage, the subsonic facility can simulate flight speeds of up to .16 Mach. The three other wind tunnels are located in Farmingdale. The transonic wind tunnel can generate airspeeds from Mach .2 to Mach 1.3, while supersonic tests range from Mach 1.75 to Mach 4. Aerotest's sophisticated hypersonic tunnel can create wind blasts of up to Mach 14.

The subsonic wind tunnel's 7x10-foot test section is huge compared to the 15", 26" and 36"

'There's a lot more involved than just turning on the fan and watching the wind blow.'

measurements of the other three wind tunnels. Attesting to its relative roominess, technicians and test engineers can easily stand inside the test bay to place a 1/6 scale model of an A-6 on a steel rod known as a sting. The sting is used to position the aircraft at any angle desired for specific tests. It also contains a system that measures the stress on the aircraft model during wind tunnel testing.

"This tunnel is what people picture when they think of a wind tunnel – a long, cylindrical building with a giant fan at one end," says technician Barry Charletta. "But there's a lot more involved than just turning on the fan and watching the wind blow."

Built in 1948, the subsonic tunnel is housed in a squat concrete and sheet metal quonset hut behind Building 25. Wind is drawn over a model by a giant fan and dumped at the rear.

Tests in the subsonic wind tunnel are monitored by remote television cameras positioned around the mounted model for a variety of observation angles. Streamers of silk and yarn, smoke or even colored oil can be used as visual aids to monitor the effects of wind on the model, and the model's effect on the air around it.

Test technicians can monitor the test via remote television screens atop an elaborate computer

'When it comes down to getting the information they need for a billion dollar aircraft program, the wind tunnel tests are invaluable.'

console. "We position cameras all around the model for a visual reference of what is happening during the tests," says Charletta. "We can alter the position of the model automatically during the test and generate a whole different set of test data. It sure beats taking still photos."

Although the tunnel is 38 years old, its subsystems have undergone many updates over the years. Its latest update: a super high-speed computer system, which will offer significant improvements in real-time data reduction and control – considered vital to the get-it-done-yesterday world of Aerotest. Identical computer systems will also be installed in the other wind tunnels.

"Before this new system, we had to translate literally hundreds of thousands of numbers generated on computer read-out sheets and make graphs manually," says Bill McAllister, who is overseeing the introduction of the new computer systems in all the wind tunnel facilities. "It took forever and was subject to human error. The new system gives us our data immediately right on a display screen or in hard copy."

Smaller but even more sophisticated, Aerotest's three other wind tunnels are called blow-down facilities, because high speed winds are created by the rapid release of pressurized air into the narrow test section.

These high speed tunnels resemble sections of giant steam pipes two or more feet in diameter. The sections are held together by nuts and bolts as big as softballs. Models are mounted behind thick glass windows in test chambers located in the center of the pipes.

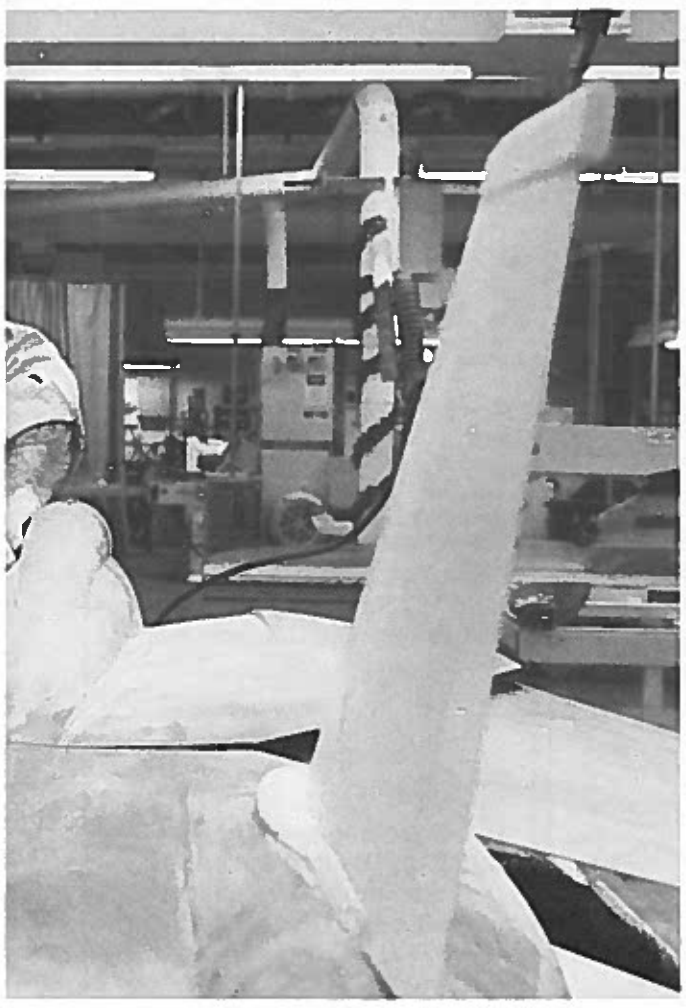
Air for the high-speed tests is kept outside the building in 3,000-pounds-per-inch white cylindrical tanks standing two stories high. When needed for tests in the transonic or supersonic tunnels, the air is channeled inside via a network of valves and steel pipes. After rushing past the mounted model, the air is vented out the other side of the building into reinforced concrete chimneys which act as mufflers. The air is then released into the atmosphere.

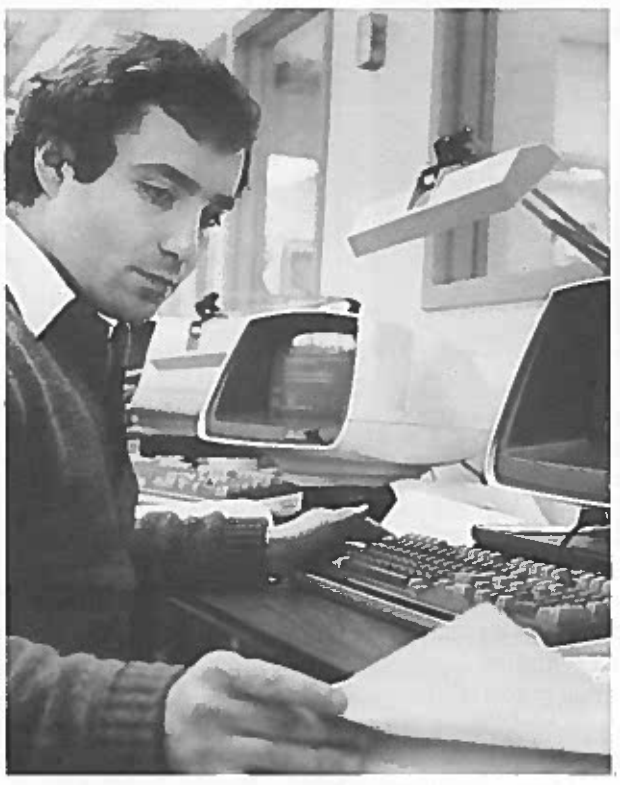
For hypersonic tests, air is first passed through 10,000 pounds of spherical alumina pebbles that are heated to approximately 3,000 degrees.

"If we didn't heat the air before releasing it into the hypersonic tunnel, it would expand and cool so fast that it would break down from a gas into liquids," explains McAfee, who is in charge of this tunnel. "All we would get is liquid hydrogen, oxygen and nitrogen dripping out the other end.

"The hypersonic wind tunnel is especially useful for thermodynamic testing for re-entry vehicles such as missiles or the Space Shuttle," says McAfee. "We can simulate the re-entry into earth's atmosphere – or breaking out of it."

"Each and every aircraft that Grumman has built or will build takes its first flight as a model inside a wind tunnel," says Blomback. "And Aerotest is the first pilot." ■





Poring Over The Data. *At Aerotest's high speed wind tunnel in Farmingdale, ground test instrumentation engineer Alex Strugatski checks through the data accumulated during a recent test run.*

Organ Donors Give The Ultimate Gift of Life

Thanks to an anonymous donor from Chicago, Grummanite Jim Watson is alive today.

Watson, a senior scheduler for Planning, Control and Budgets on the F-111 program in Melville, has had two kidney transplants. Watson had his first kidney transplant in 1977, after receiving dialysis treatment for about a year. Then, early in 1985, his doctor informed him that he would eventually need to go back on dialysis, so he signed up for another transplant.

Comparison of his two hospital stays shows how far organ transplants have advanced in a relatively short period. Watson stayed in the hospital a full eight months to recover from his first transplant. He went home a mere 10 days after his 1985 surgery.

"The second time, they were able to locate a better match," says Watson. "I still take anti-rejection drugs, but not nearly as much medication as I had to with the other transplant."

Neither transplant slowed Watson down one bit. He plays tennis twice a week and golfs. He also participates in the semi-annual Transplant Olympics, at which transplant patients from all over the world demonstrate their athletic skills.

"All of the tests indicate I'm in good condition, and I feel good," says Watson. "They keep the donors' names confidential. But it would be nice if I could look up the relatives of the person who donated my kidney, and say, 'thank you'."

On New York drivers' licenses, the organ donor designation box in the lower left hand corner is easy to overlook, but could spell the difference between life and death for a sick person. Several other states, among them California, Georgia, and Florida, also have organ donor designations on their drivers' licenses. But that isn't the only way to become an organ donor.

You can obtain an organ donor card from any of the 169 transplant centers in the U.S., or through a variety of charitable organizations – including the American Heart Association, the Kidney Foundation, and the Skin Bank. You can also write it into your will.

When you die, you can donate your heart, kidneys, lungs, skin, eyes (for corneal transplants), liver, bones, and bone marrow. Transplants of the pancreas are in the experimental stage.

The need is ever-increasing. Currently in the U.S., 80,000 people of all ages await organ transplants.

Additionally, in the last few years, heart and liver transplants have moved from the experimental stage into accepted medical practice.

Kate Loehle, a transplant coordinator at the Transplant Center, SUNY - Stony Brook University Medical Center, says the wait can be long for a transplant patient.

"It is always done on the basis of the best possible match," she says. Organs must be matched by blood and tissue type – otherwise, the patient will develop antibodies that cause the organ to be rejected. All types of transplants have been helped by the development of new drugs such as cyclosporin, which acts as a suppressant to the immune system and thereby reduces the likelihood of rejection.

"So, it's always possible that tomorrow, a donor comes along who is a good match," says Loehle. "We've had people who have waited as little as one day, while others have waited years."

When an organ becomes available, data on blood and tissue type is fed into a computer. The 169 transplant centers share a computer network, thus enabling patients all across the country to be matched with donated organs.

Kidney transplants have been performed since 1954 and are now the most common of the major organ transplants.

New York now requires hospitals to ask a deceased patient's family if that patient's organs may be donated.

If you would like information about organ donating, and/or an organ-donor card, write to Transplant, 2 E. 103rd St., New York, N.Y. 10029, or to Transplantation Services, T-19, Room 40, Stony Brook, N.Y. 11794. ■

Healthy Outlook. *Despite having two kidney transplants, Jim Watson, a senior scheduler in Melville, leads an athletic life.*

Obituaries

Robert A Okvist, Production Deputy, Calverton, Aircraft Systems, died Jan. 13 at the age of 55. He had been with the company since 1949 and resided at 26 Second St., Calverton, N.Y.

Thomas Tracy, Machine Parts Inspection, Bethpage, Aircraft Systems, died Jan. 12 at the age of 63. He had been with the company since 1952 and resided at 51 Wilson Ave., Westbury, N.Y.

Retiree Obituaries

James L. Angell of 2 Fern Dr., Commack, N.Y., died Jan. 12, 1986. He retired in 1984.

James J. Cribbins of 277 East 17th St., Huntington, N.Y., died Jan. 19, 1986. He retired in 1977.

Michael C. Finno at P.O. Box 274, Las Cruces, New Mexico, died Jan. 11, 1986. He retired in 1973.

Arthur Fletcher of 214 School St., Oyster Bay, N.Y., died Jan 17, 1986. He retired in 1972.

Henry P. Gauvreau of 103 Radcliffe Ave., Farmingdale, N.Y, died Jan. 12, 1986. He retired in 1962.

Giovanni W. Luzzatto of 122 Whitehall Blvd., Garden City, N.Y., died Jan 17, 1986. He retired in 1982.

Santo Mineo of 1509 Peacock Dr., Holiday, Florida, died Dec. 28, 1985. He retired in 1969.

Daniel A. Moore of 200 Taylor St., Centerport, N.Y., died Jan. 11, 1986. He retired in 1984.

Clifford Siebert of 533 Madison Ave., Baldwin, N.Y., died Jan. 15,1986. He retired in 1966.

Henry A. Sweezy of 14 Longshore St., Bay Shore, N.Y., died Jan 16,1986. He retired in 1971.

House Calls In Space

Rather than don a space suit, a future astronaut might repair a satellite from within the Space Station using a remote manipulator system such as the one in this photo.

Grumman has a single arm remote manipulator, designed for space use, in the Building 14 lab. This two-arm unit from Princeton University's Plasma Physics Lab had been built by Grumman for use with the Tokamak fusion reactor at Princeton. However, it has great potential for space and Grumman wanted to run a number of tests.

For example, technical specialist Erik Eriksen (seated) works a remote camera as senior engineer Bill Stasi remotely loads one container into another. The wires attached to the box simulate weightlessness. A number of other tests, including the assembly of trussed structures and the repair of tube joints, were performed with the two-arm unit.

It's now back at Princeton, but will return to Grumman in the spring for a second phase of similar tests.

Need A Match?

Did you make a contribution to your favorite college or university? Grumman has a matching gifts program that match your donation – up to $1,000.

The program is open to all Grummanites. Just send a copy of the receipt you received from the school to Carol Nelson, A12-GHQ. It is preferred that the company's gift be made in the same year as yours, but there is a grace period. If you made a contribution in 1985, submit your receipt before March 31.

For additional information, call Ext. (111) 62532.

Personals

I wish to thank my fellow co-workers for caring at a very difficult and troubled time. **Sheldon Pheffer & Family**

My family and I wish to express our sincere thanks and appreciation to all of our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my father. **Mike Hlinko**

I wish to thank all my friends at Grumman for their well wishes, care and concern during my recent surgery. I firmly believe that knowing I had such great friends helped speed my recovery. **Cal Dear**

My family and I wish to express our appreciation for the thoughtfulness expressed by my friends, co-workers and ESO during the recent loss of my mother Elizabeth Kohl. **Erwin and Frances Bruns**

We wish to express our sincere thanks and appreciation to all our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of our father Henry. **The Sweezy Family**

We wish to thank all of our friends, co-workers and ESO for their kindness and thoughtfulness during the recent loss of our mother. **Tom and Denise Zehner and Family**

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Norine Lyons
Manager – Internal Communications – Ext. 53720

Kathleen Housley
Editor – Ext. 53293

Associate Editors
Bob Sample – *Ext.55118*
John Vosilla – *Ext.58999*

Bernadette Gately
Editorial Assistant – Ext. 54334

In Northern Japan, Grummanites Got Warm Welcome

During three-year stay, 12 Grumman families have immersed themselves in Japanese culture

MISAWA, Japan – This town's name, translated from Japanese, means "three swamps."

The Grummanites who have lived in Misawa for the past three years might argue that "snowy winter" would be more appropriate. It snows a lot in this corner of the world. It's not uncommon for 200-plus inches of snowfall each winter. Even as late as June, you can still spot an occasional mound of snow on the landscape.

Misawa is on the extreme northeastern tip of Honshu, the main island of Japan. It is about 400 miles north of Tokyo. A joint U.S.-Japanese air base in Misawa is home to the Japanese Air Self Defense Force's eight E-2C Hawkeyes.

Twelve Grumman field representatives and their families went to Misawa in 1983 on two- and three-year assignments to support the aircraft. All but four will have returned to the U.S. by next month.

Misawa has strategic importance. Russia is only a few hundred miles away. In 1976, a Russian pilot defected in a MiG-25 fighter, landing at Hakodate Air Base, on the island of Hokkaido, across a bay from Misawa.

"This penetration of Japanese air space by a foreign military fighter, without interception, was one of the reasons Japan decided to acquire the E-2C early warning aircraft," notes Jim Johnson, Grumman team leader and weapon system integrator.

For these Grummanites and their families, living in Japan has been more than an extended visit to an exotic part of the globe – it has been an education.

Take the Japanese language, for example.

The Grummanites and their spouses attended a Berlitz course in Japanese before they left the U.S. Three of the couples took extra courses upon arrival, so most of them have been able to speak a rudimentary Japanese. Furthermore, most Japanese can speak some English. Thus, there was never a major language problem.

Speaking Japanese is one thing – reading and writing it is quite another. There are 1,850 characters in the *basic* Kanji, or Japanese alphabet.

There are usually multiple meanings of just one Kanji character. Therefore, the reader must know the context in which a character is used in order to comprehend Japanese reading material.

Japanese markets abound in fresh fruits and vegetables, even in northern latitudes. There are a few surprises: beef is expensive, due to import restrictions. Fresh fish costs almost as much as beef, due to pollution and depletion of fishing areas.

One item always on the menu is sushi (raw fish). Sushi comes in many varieties, and most of the Grummanites now have personal favorites.

Since this is snow country, most of the Grummanites have learned to ski – and there have been a few injuries, too. Shirley Dean suffered a cracked bone in her leg last year, but has since fully recovered.

"The ski areas are something dedicated skiers dream about," Johnson says. "Our favorite place is Appi with its manicured slopes and deep powder."

Japan is also well-known for martial arts – and living there has enabled the Grummanites to acquire, or hone, their skills. Bert Carlson and Jim Johnson have studied *shorin ryu*, a style of karate. Carlson earned his black belt, and Johnson, his brown belt.

In the workplace, there is one telling difference between the two cultures. "The difference is reflected in the way of handling a problem," says Johnson. "The usual American way is to assign an expert to solve it, and when another problem arises, another expert gets assigned to that. In contrast, the Japanese tend to tackle problems as a group."

Visiting the homes of Japanese friends, the Grummanites have experienced firsthand the cultural traditions. In a formal dinner, as in a Japanese restaurant in the U.S., the Japanese sit on the floor around a low table.

Many Japanese also sleep on straw floor mats – called tatami – and heat their homes only when they are awake. This is true even in the north. "Awakening in the morning is almost a torture," says Johnson.

Grumman rep Dan Hawley and wife, Orly, had the unusual honor of being named matchmakers for the wedding of two Japanese friends. In Japanese custom, the bride's and groom's families select the matchmaker, or matchmakers. It is almost unheard of for foreigners to be chosen.

According to this tradition, the matchmakers must help ensure the success of the marriage. They also give introductory and congratulatory speeches to the wedding guests. The Hawleys devoted two months of practice to theirs.

Three children have been born to Grumman families in Japan. They are Arthur Paul Repko, son of Bill and Olga Repko; Michael Lee McCaulley, son of Bill and Laura McCaulley; and Sarah Michelle Bickford, daughter of Dave and Maurine Bickford.

The Field Ops team has also been active in the social life on the Misawa base; popular activities with Grummanites include bowling, a rod and gun club, an auto "dirt racing" club, square dancing, the flying club, and the frequent formal dances.

Grummanite Charlie Blackwell was co-chairman of the Japanese-American Friendship Club for three years. Through this organization, Grumman families host children from a local orphanage on weekends. The Blackwells have also hosted young women from a Catholic junior college in Aomori.

Orly Hawley and Bert Carlson hit the books during their stays, earning a bachelor of arts and a bachelor of science, respectively.

Most of the Grummanites will return to the U.S. next month. A small permanent crew will remain, consisting of site manager Doyle Bishop, Dave Bluin, base administrator, and Grumman secretary Sawako Kaneno. The Johnsons and the Blackwells will remain one more year, until the weapon system integration task is complete.

"It has been a successful three-year business effort with the Japanese," says Johnson. "Although everyone seems eager to get back to the U.S., they'll all miss Japan and the Japanese people. Living here has been the opportunity of a lifetime – and the memories will last a lifetime." ■

Friends And Memories. *(Top) Grummanites found the mountains of Northern Japan to be excellent for skiing. (Mid left) Sarah Michelle Beckford is one of three children born to Grummanites in Japan. (Above) Dan (L) and Orly (R) Hawley served as matchmakers in the traditional wedding ceremony of Japanese friends. (Left) Offra and Jim Johnson (seated) congratulate newlywed friends, Mr. and Mrs. Satamura, at wedding reception.*

Dollars For Scholars

Deadline for entry in the 1986 Grumman Manufacturing/ Engineering Technology Scholarship competition is March 15.

If you have an associate's degree in manufacturing engineering or technology or have two years of engineering school under your belt, you can apply for this two-year scholarship. The company will award two scholarships in 1986.

The program is open to all Grummanites, as well as any Long Island students who meet the requirements. Scholarship winners receive annual awards that they apply towards tuition, fees and expenses for their four-year degrees. Last year, the award was $4,500. These scholarships can be used in any accredited program in the country.

When scholarship winners graduate, they return to manufacturing engineering jobs within Grumman. A dozen winners are now using their degrees at Grumman, while another 13 are working toward degrees.

For more information, contact Fred Neuscheler, Ext. (111) 58268, Mail Stop B18-02.

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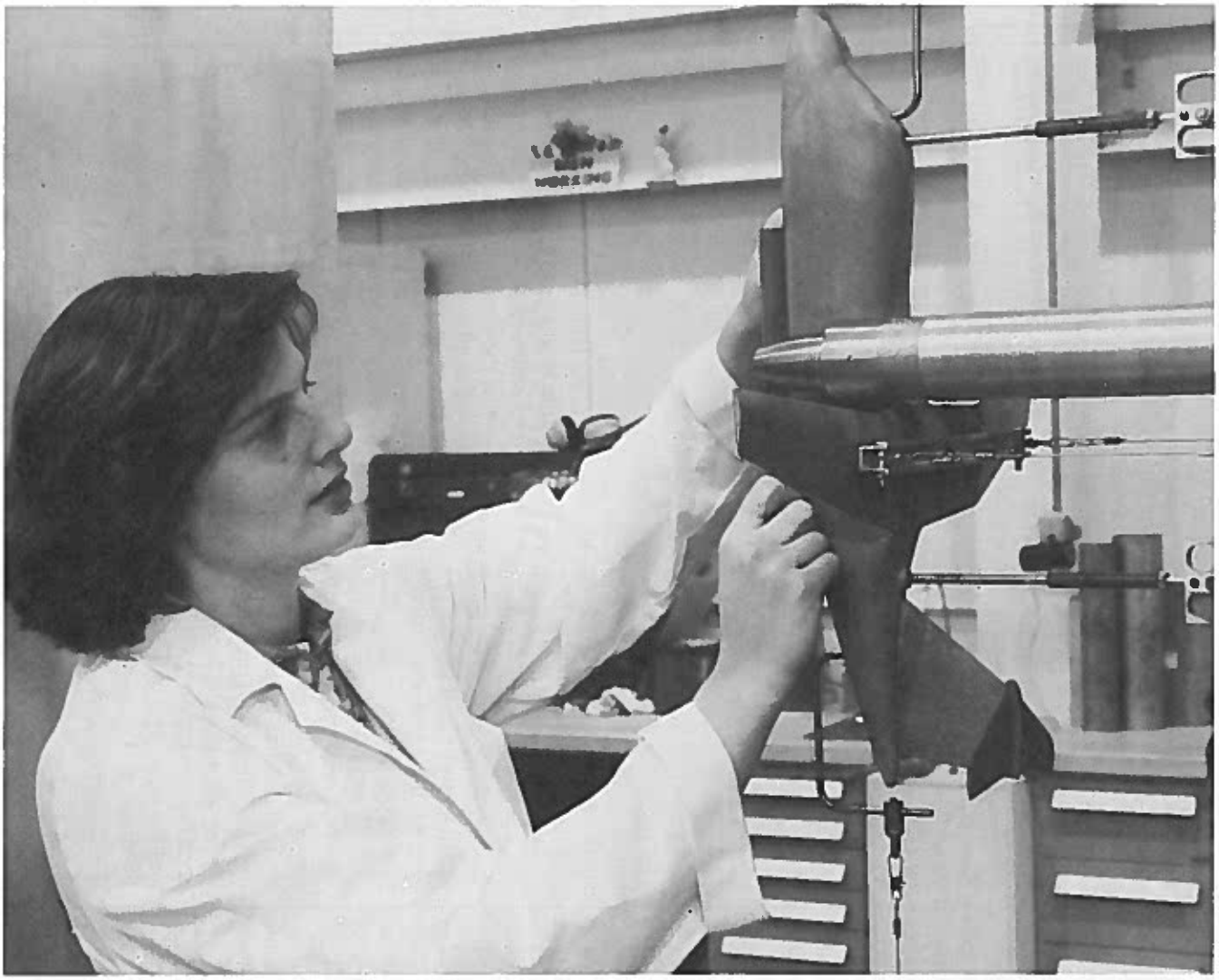
(Photo by Bob Settles)

No Room For Tunnel Vision

In Grumman's high-speed wind tunnel, technician Hank Frost gets a scale model of the F-14 Tomcat ready for a test run. Wind tunnel tests generate reams of data on aerodynamics, propulsion and thermodynamics for new airframe designs. Design engineers from virtually every Grumman aircraft program turn to Aerotest at some point to find out if their ideas really work. (See story on page 4)



(Photo by Jim Wagner)

What If... *What happens if one of the jet engines on a Grumman-designed VTOL (Vertical Takeoff and Landing) aircraft malfunctions? Karen Kanarek is trying to find out. In this small-scale hover test, she is investigating the effects a small, auxiliary lift engine would have on the VTOL plane. Using a 1/24th scale model, the study will also show the effects one or two of these engines would have on carrying power.*

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